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Application No.	S2002/0038
Date of Filing	24 January 2002
Applicant	EXA SA, a Swiss company of Case Postale 40, CH-1223 Geneva, Switzerland.

Dated this 4TH day of November 2002.

PRIORITY DOCUMENT
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Brian McKernan

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FORM NO. 1

APPLICATION NO. S020038

REQUEST FOR THE GRANT OF A PATENT

PATENTS ACT, 1992

The Applicant(s) named herein hereby request(s)

[ ] the grant of patent under Part II of the Act

[X] the grant of short-term patent under Part III of the Act

on the basis of the information furnished hereunder.

1. Applicant(s)

Name Exa SA

Address Case Postale 40, CH-1223 Geneva, Switzerland

Description/Nationality

A Swiss Company

2. Title of Invention

"Cleaning Agent and a Process for Removing Coatings"

3. Declaration of Priority on basis of previously filed Application(s) for same invention (Sections 25 & 26)

Previous filing date	Country in or for Which filed	Filing No

4. Identification of Inventor(s)

Name(s) of person(s) believed By Applicant(s) to be the inventor(s) Pierre ROCHAT

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18 Chemin de la Haute Belotte
1222 Vesenaz, Geneva
Switzerland

5. Statement of right to be granted a patent (Section 17 (2) (b)

6. Items accompanying this Request – tick as appropriate

(i) [X] Prescribed filing fee (EUR 60.00)

(ii) [ ] Specification containing a description and claims

[X] Specification containing a description only

[X] Drawings referred to in description or claims

(iii) [ ] An abstract

(iv) [ ] Copy of previous application(s) whose priority is claimed

(v) [ ] Translation of previous application whose priority is claimed

(vi) [ ] Authorisation of Agent (this may be given at 8 below if this Request is signed by the Applicant(s)

7. Divisional Application(s)

The following information is applicable to the present application which is made under Section 24-

Earlier Application No: .....

Filing Date: .....

8. Agent

The following is authorised to act as agent in all proceedings connected with the obtaining of a patent to which this request relates and in relation to any patent granted

Name	**Address**
Naoise Gordon	Murgitroyd & Co. Regus House Harcourt Centre Harcourt Road Dublin 2

9. Address for Service (if different from that at 8)

Signed For and on behalf of the Applicant Company by

Naoise Gordon
(Agent for the Applicant)

Date 24 January 2002

Cleaning Agent and a Process for Removing Coatings

The present invention relates to a process for cleaning a surface of the type which employs a particulate cleaning agent. The invention also relates to a particulate cleaning agent and a process for the production thereof.

Cleaning of the surfaces of various types of equipment and structures is often desirable. Numerous processes and cleaning agents are known in the art. The choice of process and agent depends to a great extent on the coating to be removed and on the substrate. In addition, the working conditions and the environmental effects of the process and agent used are becoming increasingly important factors when selecting an optimal cleaning technique.

Sand blasting and other abrasive techniques are quite applicable on hard substrates, but require

special arrangements to meet the specification related to environment and working conditions.

Less hard and durable substrates like aluminium, wood and composite materials require processes and cleaning agents which do not cause mechanical or chemical damage to the surface of the substrate.

An object of the present invention is to select agents for cleaning, decontaminating, and removing coatings, which agents are environmentally acceptable and do not possess the limitations and disadvantages of known agents.

A further object is the provision of an improved process for cleaning substrates without substantially damaging, mechanically or chemically, the substrate surface.

According to the invention, there is provided a process for cleaning a surface of the type which employs a cleaning agent comprising a plurality of particles, the process comprising the step of projecting and/or accelerating the particles of the cleaning agent towards, or along, the surface to the cleaned such that at least some of the particles roll along at least a portion of the surface, wherein an angle of incidence of the particles and the surface is between 0° and 60°, and wherein the particles are dimensioned to effect a rolling movement along the surface.

When the projected particle impacts the substrate at a low angle of incidence it rolls along the surface, rubbing and absorbing the coating from the surface.

Preferably, the particles are generally round. In this specification the term "generally round" as applied to particles should be understood to mean any shape which of particle which enables the particle to easily assume a rolling motion when moved along a surface. As such, while the term is primarily intended to refer to spherical particles, it is not intended to exclude other types of spheroids such as spheres having an oblong or elliptical shape. Typically, the particles will have an irregular surface configuration.

Ideally, the particles are relatively soft. Generally, the particles have an average hardness of less than 10 Mohs, typically less than 8 Mohs, and preferably less than 6 Mohs. Typically, the particles will have an average hardness of at least 1 Mohs, and preferably of at least 2 Mohs. In a preferred embodiment of the invention, the particles will have an average hardness of about 3 Mohs. Typically, the particles have an average maximum diameter of between 30 and 1000 microns.

When the process of the invention involves projecting and/or accelerating the particles towards the surface, various means of projection are envisaged, such as for example, mechanical projection (i.e. centrifugal particle acceleration),

pneumatic particle projection and electrostatic particle projection. A mechanical particle projecting device which is suitable for carrying out the process of the invention is described in International Patent Application No PCT/EP00/09960.

The process of the invention also encompasses manual projection of the particles along the surface. In this regard the particles may be rubbed along the surface using a cloth, by hand, or by any other means.

The invention also relates to a particulate composition for use in cleaning a surface, the composition comprising a multiplicity of particles, each particle being generally round such that upon impacting with the surface at an angle of incidence of between 0° and 60°, the particle rolls along the surface.

The invention also relates to the particulate composition of the invention for use in the manufacture of a cleaning agent, particularly an industrial cleaning agent.

The invention also relates to a process for producing the particulate cleaning composition and cleaning agent of the invention, the particulate composition and cleaning agent being obtainable by precipitation or flocculation of a suitable carbonate. Typically, the carbonate is calcium carbonate. Alternatively, the carbonate may be

magnesium carbonate. In a further embodiment of the invention, the particle composition comprises an alkali sulphate or magnesium sulphate. In a yet further embodiment of the invention, the particle composition comprises a plastic, metal, polymer or any other material having the required physical characteristics.

Use of the process and cleaning agent of the invention has the effect of removing coatings without damaging the surface of the substrate. It should also be possible to clean complete structures and equipment having complex geometrical configurations such as valves, bridges etc having parts which are difficult to access with conventional cleaning equipment or blasting jets.

After having cleaned the substrate according to the process of the invention the cleaning agent is easily removed together with the removed coating. The cleaning agent itself is environmentally acceptable.

The invention will be more clearly understood from the following description of some embodiments thereof, given by way of example only, with reference to the following figures in which:

Fig 1 is an illustration of a particle of a cleaning agent according to the invention; and

Fig 2 illustrates the process of the invention.

The present invention has been found to be effective at removing various types of coatings from substrates having hardness from that of steel to wood (or even softer materials) without causing damage to the subtracts surface. The cleaning agent can easily be removed by flushing with water. The person carrying out the cleaning process is not exposed to any harm and the agent is acceptable from an environmental point of view. The agent is also available in desired qualities, particle size, hardness etc.

Referring to the drawings, and initially to Fig 1, there is illustrated a particle, indicated generally by the reference numeral 1, which is used in the process of the invention. The particle has a generally round, and slightly irregular, shape and a rough, irregular, surface configuration.

Referring to Fig 2, the process of the invention is illustrated in which the particle 1 is projected towards a surface 2 having a coating 3 to be removed. Due to the low angle of incidence of the particle 1 and the surface 2, and the generally round shape of the particle 1, upon impact the particle 1 rolls along the surface, rubbing the surface and absorbing the coating 3 onto a surface of the particle. This has the net effect of removing the coating from the surface without causing any damage to the surface.

Example 1

Method of production of particles.

Production of insoluble particles CaCO3 is done having free Ca^{++} in a liquid with a PH over 7. Then we add CO_2 and obtain precipitated $CaCO_3$.

$$Ca^{++} + 2OH^- + CO_2 \rightarrow CaCO_3 + H_2O$$

We obtain different type of particles and crystalisation type by the regulation of the conditions of the precipitate

Various other methods of production of particles according to the invention have been investigated using various types of substrates including plastic, metal and polymer. Examples of these methods include:

Chemical

There are numerous chemical methods for producing spherical powders. Generally, chemical methods result in very fine powder particle sizes. Such methods include Sol Gel, chemical precipitation, Reaction, reduction (hydrogen in an autoclave to reduce metal salts to the metal), decomposition (eg metal carbonyls) and Electrolysis.

Spray drying

This is the most widely used industrial process involving particle formation and drying. It is

highly suited for the continuous production of dry solids in either powder, granulate or agglomerate form from liquid feedstocks as solutions, emulsions and pumpable suspensions

Agglomeration

The most common method of agglomeration is where the constituents are physically mixed together with an organic binder. The solvent is then driven off and the resultant material sized. The binder should be burnt off during spraying. This process is used in the manufacture of NiAl, AlSi or polyester powders.

Atomisation

There are a number of atomisation techniques which all rely on the production of a molten pool as the source. Atomisation methods include Rotating Electrode, Vibrating Electrode (arc), Centrifugal (from a melt) and Rapid Solidification (eg aluminium ribbon). However, by far the most commonly used methods are either water or gas atomisation.

Others

- Solid State Reduction
- Electrolysis
- Electrodeposition
- Mechanical Comminution

The invention is not limited to the embodiments hereinbefore described which may be varied in both construction and process step without departing from the invention.

Fig. 1

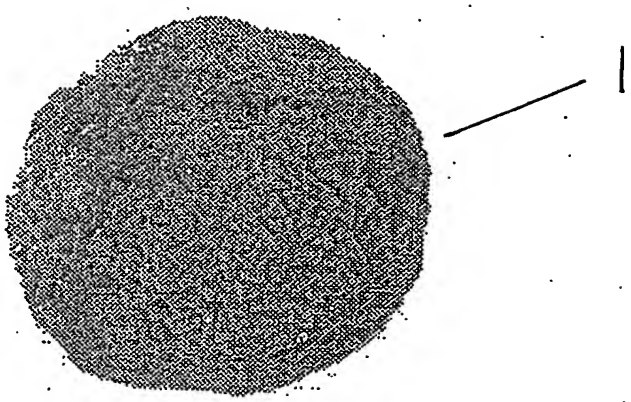

Fig. 2